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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,352	04/13/2004	Eun-ae Chung	5649-1299	4723
20792	7590	03/01/2006	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			GEYER, SCOTT B	
PO BOX 37428			ART UNIT	
RALEIGH, NC 27627			PAPER NUMBER	
			2812	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PN

Office Action Summary	Application No.	Applicant(s)	
	10/823,352	CHUNG ET AL.	
	Examiner	Art Unit	
	Scott Geyer	2812	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

The drawings received on April 13, 2004 are acceptable.

Claim Rejections - 35 USC § 112

The rejection of claim 27 under 35 USC 112, second paragraph, is moot in view of the applicant's amendment to the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 17, 26, 28, 29, 32 and 34 are rejected under 35 U.S.C. 102(a) as being anticipated by Gutsche et al. (6,693,016 B2).

As to **claim 17**, Gutsche et al. teach a method of making a capacitor structure including formation of a lower electrode (step k), formation of a capacitor dielectric layer

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on the lower electrode (step q), formation of a metallic layer on the dielectric layer (step r) and formation of a polysilicon germanium layer on the metallic layer (step s). See col. 6, lines 50-67, continued to col. 7, lines 1-6.

As to **claim 26**, Gutsche et al. teach tungsten as a metal for the upper electrode. See col. 7, lines 47-54.

As to **claim 28**, Gutsche et al. teach the lower electrode comprising a metallic layer. See col. 7, lines 47-54.

As to **claims 29, 32 and 34**, Gutsche et al. teach a method of making a capacitor structure including formation of a lower metallic electrode (step k), formation of a capacitor dielectric layer on the lower electrode (step q) and formation of a polysilicon germanium layer dielectric. See col. 6, lines 50-67, continued to col. 7, lines 1-6.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-25, 27, 33 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutsche et al. (6,693,016 B2) as applied to claims 17 and 29 above respectively, and further in view of Economikos et al. (6,180,480 B1).

As to **claim 18**, Gutsche et al. disclose the method as claimed and rejected above, but does not disclose the method wherein the silicon germanium layer is a

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doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer, nor the method of doping. Economikos et al. disclose the method of forming a doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer (see column 3, line 40 through column 4, line 25) and the method of doping the poly $\text{Si}_{1-x}\text{Ge}_x$ layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Gutsche et al. with a doped poly layer as taught by Economikos et al. so as to form an electrically conductive path.

As to **claims 19 and 20**, the combined Gutsche et al. and Economikos et al. disclose the method wherein the doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer is formed by doping a poly $\text{Si}_{1-x}\text{Ge}_x$ layer with P, As or B (see Economikos et al. column 4, lines 15-25).

As to **claim 21**, the combined Gutsche et al. and Economikos et al. disclose the method wherein the doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer is formed by depositing a poly $\text{Si}_{1-x}\text{Ge}_x$ while simultaneously doping impurities (an in situ process, see Economikos et al. column 4, lines 15-25).

As to **claims 22 and 23**, the combined Gutsche et al. and Economikos et al. disclose the method wherein the doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer is deposited and simultaneously activated at temperatures between about 350oC and 550oC (see temperatures of Economikos et al. at column 3, line 40 through column 4, line 4, some of which are sufficient to activate).

As to **claims 24 and 25**, the combined Gutsche et al. and Economikos et al. disclose the method wherein the doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer is deposited and then activation and thermal treatment is performed at a temperature between about 400oC and 550oC (see Economikos et al. column 4, lines 45-50).

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As to **claim 27**, the combined Gutsche et al. and Economikos et al. disclose the method wherein the doped poly $\text{Si}_{1-x}\text{Ge}_x$ layer is formed using LPCVD using furnace type equipment, single wafer type equipment and/or mini-batch equipment (see Economikos et al. column 3, lines 40-53).

As to **claims 30 and 31**, the combined Gutsche et al. and Economikos et al. disclose the method further comprising thermally treating the $\text{Si}_{1-x}\text{Ge}_x$ layer at about 550oC or less (see Economikos et al. column 4, lines 45-50).

As to **claim 33**, the combined Gutsche et al. and Economikos et al. disclose the method further comprising thermally treating the $\text{Si}_{1-x}\text{Ge}_x$ layer at about 550oC or less (see Economikos et al. column 4, lines 45-50).

Response to Arguments

Applicant's arguments with respect to claims 17-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Geyer whose telephone number is (571) 272-1958. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 2/23/06

Scott B. Geyer
Primary Examiner
February 23, 2006